

CORRESPONDENCE

Letters to the Editor

Secondhand Smoke Exposure and Protective Effects

It was of deep interest for me to read the article by Hamer et al. (1) on cardiovascular risk and secondhand smoke (SHS) exposure. After having analyzed data on salivary cotinine measurements in more than 13,400 middle-aged English and Scottish adults, the investigators concluded that participants exposed to high SHS (21% of the total sample) had: 1) elevated levels of low-grade inflammation; and 2) elevated risk of cardiovascular death (over a follow-up of 8 years) that was partly accounted for by the former change.

Both conclusions seem to be far from convincing and objective. When the mean cotinine levels in current smokers is considered 100, those in high SHS was 1 and those in the medium SHS category 0.06. The referent group (one-eighth of the sample) represented virtually the unexposed category. A biologic parameter that shows a more than 1,500-fold variation across active and passive smokers cannot be used as a continuous parameter over the whole range. Indeed, Cox regression analyses indicated that the association between cotinine categories and both the overall and cardiovascular mortality is not linear: it was lowest in the medium SHS category (65% of nonsmokers exposed to SHS), which hence deserves the greatest attention.

Compared with the referent group, the medium SHS category displayed no differences in any of the 4 studied parameters: high-density lipoprotein cholesterol, fibrinogen, C-reactive protein (CRP), and systolic blood pressure. Because systolic blood pressure was unchanged even in smokers, CRP was the only parameter that was raised in the high SHS category significantly, albeit marginally. The increment in CRP, 1.2-fold, is one-sixth of 1 SD, given that 1 SD represents 3-fold values (2). Because such an increment, adjusted for conventional risk factors, confers a hazard ratio (HR) of 1.37 (2), the elicited difference corresponds to merely 1.05, not likely to have a significant influence on the studied risks.

In Cox regression models 2, compared with the referent unexposed group, the medium SHS category revealed a borderline significantly lower mortality (by 15%) and again 15% lower cardiovascular deaths, although the difference is insignificant owing to limited statistical power. High SHS displays HRs for overall and cardiovascular mortality similar to the unexposed group (despite a higher prevalence of diabetes).

To sum up, what one can conclude from this paper on the issue of SHS and cardiovascular risk is that the influence of salivary cotinine (by inference, plasma nicotine) is nonlinear but exerts a threshold effect. High exposure to SHS confers no excess cardiovascular or all-cause mortality compared with unexposed individuals, whereas moderate SHS exposure (representing the majority of passive smokers) tends to reduce the risk of death, by approximately 15%. This inference is not surprising in view of the

fact that even active smoking has been reported to have beneficial effects on the risk of type 2 diabetes (3) and marginal effects on the risk of coronary heart disease in the general population (4); in addition, there have been reduced fasting glucose levels among smokers (5).

The data of Hamer et al. (1) thus call for globally reassessing the dogmatic acceptance of an adverse relation between active and passive smoking and cardiovascular risk, requiring taking into account genetics, sex, ethnicities, degree of exposure, and glucose intolerance.

*Altan Onat, MD

*Cerrahpaşa Medical Faculty
Istanbul University
34335 Istanbul
Turkey
E-mail: alt_onat@yahoo.com.tr

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Reply

We thank Dr. Onat for his comments on our recent paper (1). Regarding the first issue, it would indeed be inappropriate to model cotinine as a continuous parameter because it has a large variation and highly skewed distribution. That is why we transformed cotinine into a categorical variable, which is considered a standard epidemiologic approach to deal with this issue. When creating a categorical variable, it is inevitable that arbitrary cut points will be used, and this might be one reason for the lack of linearity observed. Dr. Onat alludes to the medium secondhand smoke (SHS) category having a borderline significantly lower risk; however, in fact, the 95% confidence intervals for

cardiovascular disease (CVD) death in the fully adjusted model (0.62 to 1.19) provide no robust evidence for an association. Furthermore, the results in never-smokers do suggest a clear linear association between SHS and CVD death (hazard ratios for medium and high SHS categories are 1.28 and 2.22, respectively). The inclusion of ex-smokers in the main analyses might have considerably masked the true effects of SHS because ex-smokers already have an excess risk of mortality (2), and thus the presence of ex-smokers in the low SHS-exposed group may dilute the effects.

In relation to the issue regarding C-reactive protein (CRP), we agree that these data should be viewed cautiously because it is unclear if CRP does play a causal role in CVD etiology or is merely a biomarker (3). In the present studied cohort, CRP is independently associated with CVD events, although it does not add prognostic significance to established models such as the Framingham risk score (4).

Last, we are certainly not in agreement with Dr. Onat's opinion that our data call for reassessing the acceptance of an adverse relation between active and passive smoking and CVD risk. Our data clearly show a strong association between active smoking and CVD, which is consistent with a plethora of previous epidemiologic evidence over the past few decades. We believe our data also support an association between SHS and CVD, especially in never-smokers. Future large-scale studies, such as the recent data from the European Prospective Investigation into Cancer and Nutrition (5), are required to further explore this potentially important public health issue.

***Mark Hamer, PhD**
Emmanuel Stamatakis, PhD
Mika Kivimäki, PhD
Gordon D. Lowe, DSc
G. David Batty, PhD

*Department of Epidemiology and Public Health
University College London
1-19 Torrington Place
London, WC1E 6BT
United Kingdom
E-mail: m.hamer@ucl.ac.uk

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